

## SEQUENCE LISTING

Thr Asp Pro Glu Val Thr Asn Tyr Ser Leu Lys Gly Cys Gln Gly Lys			
140	145	150	
cct ctt ccc aag gac ttg agg ttt att cct gac ccc aag gcg ggc atc			531
Pro Leu Pro Lys Asp Leu Arg Phe Ile Pro Asp Pro Lys Ala Gly Ile			
155	160	165	170
atg atc aaa agt gtg aaa cgc gcc tac cat cgg ctc tgt ctg cat tgt			579
Met Ile Lys Ser Val Lys Arg Ala Tyr His Arg Leu Cys Leu His Cys			
175	180	185	
tct gtg gac cag gag ggc aag tca gtg ctg tcg gaa aaa ttc atc ctg			627
Ser Val Asp Gln Glu Gly Lys Ser Val Leu Ser Glu Lys Phe Ile Leu			
190	195	200	
aaa gtg agg cca gcc ttc aaa gct gtg cct gtt gtg tct gtg tcc aaa			675
Lys Val Arg Pro Ala Phe Lys Ala Val Pro Val Val Ser Val Ser Lys			
205	210	215	
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Ala Ser Tyr Leu Leu Arg Glu Gly Glu Phe Thr Val Thr Cys Thr			
220	225	230	
ata aaa gat gtg tct agt tct gtg tac tca acg tgg cat cac ggt gac			771
Ile Lys Asp Val Ser Ser Val Tyr Ser Thr Trp Lys Arg Glu Asn			
235	240	245	250
agt cag act aaa cta cag gag aaa tat aat agc tgg cat cac ggt gac			819
Ser Gln Thr Lys Leu Gln Glu Lys Tyr Asn Ser Trp His His Gly Asp			
255	260	265	
ttc aat tat gaa cgt cag gca acg ttg act atc agt tca gcg aga gtt			867
Phe Asn Tyr Glu Arg Gln Ala Thr Leu Thr Ile Ser Ser Ala Arg Val			
270	275	280	
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Asn Asp Ser Gly Val Phe Met Cys Tyr Ala Asn Asn Thr Phe Gly Ser			
285	290	295	
gca aat gtc aca aca acc ttg gaa gta gta gat aaa gga ttc att aat			963
Ala Asn Val Thr Thr Leu Glu Val Val Asp Lys Gly Phe Ile Asn			
300	305	310	
atc ttc ccc atg ata aac act aca gta ttt gta aac gat gga gaa aat			1011
Ile Phe Pro Met Ile Asn Thr Thr Val Phe Val Asn Asp Gly Glu Asn			
315	320	325	330
gta gat ttg att gtt gaa tat gaa gca ttc ccc aaa cct gaa cac cag			1059
Val Asp Leu Ile Val Glu Tyr Glu Ala Phe Pro Lys Pro Glu His Gln			
335	340	345	
cag tgg atc tat atg aac aga acc ttc act gat aaa tgg gaa gat tat			1107
Gln Trp Ile Tyr Met Asn Arg Thr Phe Thr Asp Lys Trp Glu Asp Tyr			
350	355	360	
ccc aag tct gag aat gaa agt aat atc aga tac gta agt gaa ctt cat			1155
Pro Lys Ser Glu Asn Glu Ser Asn Ile Arg Tyr Val Ser Glu Leu His			
365	370	375	
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Leu Thr Arg Leu Lys Gly Thr Glu Gly Thr Tyr Thr Phe Leu Val			
380	385	390	

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att gtg atg att ctg acc tac aaa tat tta cag aaa ccc atg tat gaa Ile Val Met Ile Leu Thr Tyr Lys Tyr Leu Gln Lys Pro Met Tyr Glu 540 545 550	1683
gta cag tgg aag gtt gtt gag gag ata aat gga aac aat tat gtt tac Val Gln Trp Lys Val Val Glu Glu Ile Asn Gly Asn Asn Tyr Val Tyr 555 560 565 570	1731
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aac agg ctg agt ttt ggg aaa acc ctg ggt gct gga gct ttc ggg aag Asn Arg Leu Ser Phe Gly Lys Thr Leu Gly Ala Gly Ala Phe Gly Lys 590 595 600	1827
gtt gtt gag gca act gct tat ggc tta att aag tca gat gcg gcc atg Val Val Glu Ala Thr Ala Tyr Gly Leu Ile Lys Ser Asp Ala Ala Met 605 610 615	1875
act gtc gct gta aag atg ctc aag ccg agt gcc cat ttg aca gaa cgg Thr Val Ala Val Lys Met Leu Lys Pro Ser Ala His Leu Thr Glu Arg 620 625 630	1923
gaa gcc ctc atg tct gaa ctc aaa gtc ctg agt tac ctt ggt aat cac Glu Ala Leu Met Ser Glu Leu Lys Val Leu Ser Tyr Leu Gly Asn His 635 640 645 650	1971

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ctg gtc att aca gaa tat tgt tgc tat ggt gat ctt ttg aat ttt ttg Leu Val Ile Thr Glu Tyr Cys Cys Tyr Gly Asp Leu Leu Asn Phe Leu 670 675 680	2067
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gaa gct gca ctt tat aag aat ctt ctg cat tca aag gag tct tcc tgc Glu Ala Ala Leu Tyr Lys Asn Leu Leu His Ser Lys Glu Ser Ser Cys 700 705 710	2163
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 35 40 45

Arg Val Gly Asp Glu Ile Arg Leu Leu Cys Thr Asp Pro Gly Phe Val  
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Lys Trp Thr Phe Glu Ile Leu Asp Glu Thr Asn Glu Asn Lys Gln Asn  
 65 70 75 80

Glu Trp Ile Thr Glu Lys Ala Glu Ala Thr Asn Thr Gly Lys Tyr Thr  
 85 90 95

Cys Thr Asn Lys His Gly Leu Ser Asn Ser Ile Tyr Val Phe Val Arg  
100 105 110

Asp Pro Ala Lys Leu Phe Leu Val Asp Arg Ser Leu Tyr Gly Lys Glu  
115 120 125

Asp Asn Asp Thr Leu Val Arg Cys Pro Leu Thr Asp Pro Glu Val Thr  
130 135 140

Asn Tyr Ser Leu Lys Gly Cys Gln Gly Lys Pro Leu Pro Lys Asp Leu  
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Arg Phe Ile Pro Asp Pro Lys Ala Gly Ile Met Ile Lys Ser Val Lys  
165 170 175

Arg Ala Tyr His Arg Leu Cys Leu His Cys Ser Val Asp Gln Glu Gly  
180 185 190

Lys Ser Val Leu Ser Glu Lys Phe Ile Leu Lys Val Arg Pro Ala Phe  
195 200 205

Lys Ala Val Pro Val Val Ser Val Ser Lys Ala Ser Tyr Leu Leu Arg  
210 215 220

Glu Gly Glu Glu Phe Thr Val Thr Cys Thr Ile Lys Asp Val Ser Ser  
225 230 235 240

Ser Val Tyr Ser Thr Trp Lys Arg Glu Asn Ser Gln Thr Lys Leu Gln  
245 250 255

Glu Lys Tyr Asn Ser Trp His His Gly Asp Phe Asn Tyr Glu Arg Gln  
260 265 270

Ala Thr Leu Thr Ile Ser Ser Ala Arg Val Asn Asp Ser Gly Val Phe  
275 280 285

Met Cys Tyr Ala Asn Asn Thr Phe Gly Ser Ala Asn Val Thr Thr Thr  
290 295 300

Leu Glu Val Val Asp Lys Gly Phe Ile Asn Ile Phe Pro Met Ile Asn  
305 310 315 320

Thr Thr Val Phe Val Asn Asp Gly Glu Asn Val Asp Leu Ile Val Glu  
325 330 335

Tyr Glu Ala Phe Pro Lys Pro Glu His Gln Gln Trp Ile Tyr Met Asn  
340 345 350

Arg Thr Phe Thr Asp Lys Trp Glu Asp Tyr Pro Lys Ser Glu Asn Glu  
355 360 365

Ser Asn Ile Arg Tyr Val Ser Glu Leu His Leu Thr Arg Leu Lys Gly  
370 375 380

Thr Glu Gly Gly Thr Tyr Thr Phe Leu Val Ser Asn Ser Asp Val Asn  
385 390 395 400

Ala Ala Ile Ala Phe Asn Val Tyr Val Asn Thr Lys Pro Glu Ile Leu  
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Thr Tyr Asp Arg Leu Val Asn Gly Met Leu Gln Cys Val Ala Ala Gly  
420 425 430

Phe Pro Glu Pro Thr Ile Asp Trp Tyr Phe Cys Pro Gly Thr Glu Gln  
435 440 445

Arg Cys Ser Ala Ser Val Leu Pro Val Asp Val Gln Thr Leu Asn Ser  
450 455 460

Ser Gly Pro Pro Phe Gly Lys Leu Val Val Gln Ser Ser Ile Asp Ser  
465 470 475 480

Ser Ala Phe Lys His Asn Gly Thr Val Glu Cys Lys Ala Tyr Asn Asp  
485 490 495

Val Gly Lys Thr Ser Ala Tyr Phe Asn Phe Ala Phe Lys Gly Asn Asn  
500 505 510

Lys Glu Gln Ile His Pro His Thr Leu Phe Thr Pro Leu Leu Ile Gly  
515 520 525

Phe Val Ile Val Ala Gly Met Met Cys Ile Ile Val Met Ile Leu Thr  
530 535 540

Tyr Lys Tyr Leu Gln Lys Pro Met Tyr Glu Val Gln Trp Lys Val Val  
545 550 555 560

Glu Glu Ile Asn Gly Asn Asn Tyr Val Tyr Ile Asp Pro Thr Gln Leu  
565 570 575

Pro Tyr Asp His Lys Trp Glu Phe Pro Arg Asn Arg Leu Ser Phe Gly  
580 585 590

Lys Thr Leu Gly Ala Gly Ala Phe Gly Lys Val Val Glu Ala Thr Ala  
595 600 605

Tyr Gly Leu Ile Lys Ser Asp Ala Ala Met Thr Val Ala Val Lys Met  
610 615 620

Leu Lys Pro Ser Ala His Leu Thr Glu Arg Glu Ala Leu Met Ser Glu  
625 630 635 640

Leu Lys Val Leu Ser Tyr Leu Gly Asn His Met Asn Ile Val Asn Leu  
645 650 655

Leu Gly Ala Cys Thr Ile Gly Gly Pro Thr Leu Val Ile Thr Glu Tyr  
660 665 670

Cys Cys Tyr Gly Asp Leu Leu Asn Phe Leu Arg Arg Lys Arg Asp Ser  
675 680 685

Phe Ile Cys Ser Lys Gln Glu Asp His Ala Glu Ala Ala Leu Tyr Lys  
690 695 700

Asn Leu Leu His Ser Lys Glu Ser Ser Cys Ser Asp Ser Thr Asn Glu  
705 710 715 720

Tyr Met Asp Met Lys Pro Gly Val Ser Tyr Val Val Pro Thr Lys Ala  
725 730 735

Asp Lys Arg Arg Ser Val Arg Ile Gly Ser Tyr Ile Glu Arg Asp Val  
740 745 750

Thr Pro Ala Ile Met Glu Asp Asp Glu Leu Ala Leu Asp Leu Glu Asp  
755 760 765

Leu Leu Ser Phe Ser Tyr Gln Val Ala Lys Gly Met Ala Phe Leu Ala  
770 775 780

Ser Lys Asn Cys Ile His Arg Asp Leu Ala Ala Arg Asn Ile Leu Leu  
785 790 795 800

Thr His Gly Arg Ile Thr Lys Ile Cys Asp Phe Gly Leu Ala Arg Asp  
805 810 815

Ile Lys Asn Asp Ser Asn Tyr Val Val Lys Gly Asn Ala Arg Leu Pro  
820 825 830

Val Lys Trp Met Ala Pro Glu Ser Ile Phe Asn Cys Val Tyr Thr Phe  
835 840 845

Glu Ser Asp Val Trp Ser Tyr Gly Ile Phe Leu Trp Glu Leu Phe Ser  
850 855 860

Leu Gly Ser Ser Pro Tyr Pro Gly Met Pro Val Asp Ser Lys Phe Tyr  
 865 870 875 880

Lys Met Ile Lys Glu Gly Phe Arg Met Leu Ser Pro Glu His Ala Pro  
 885 890 895

Ala Glu Met Tyr Asp Ile Met Lys Thr Cys Trp Asp Ala Asp Pro Leu  
 900 905 910

Lys Arg Pro Thr Phe Lys Gln Ile Val Gln Leu Ile Glu Lys Gln Ile  
 915 920 925

Ser Glu Ser Thr Asn His Ile Tyr Ser Asn Leu Ala Asn Cys Ser Pro  
 930 935 940

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Asp Leu Leu Cys Val Leu Val Leu Leu Arg Gly Gln Thr Ala Thr  
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tct cag cca tct gca agt cca ggg gag ccg tct ccg cca tcc atc cat 148  
Ser Gln Pro Ser Ala Ser Pro Gly Glu Pro Ser Pro Ser Ile His  
25 30 35 40

cca gca caa tca gag tta ata gtt gaa gct ggc gac acc ctc agc ctg 196  
Pro Ala Gln Ser Glu Leu Ile Val Glu Ala Gly Asp Thr Leu Ser Leu  
45 50 55

acg tgc att gat ccc gac ttt gtc aga tgg act ttc aag acc tat ttc 244  
Thr Cys Ile Asp Pro Asp Phe Val Arg Trp Thr Phe Lys Thr Tyr Phe  
60 65 70

aat gaa atg gtt gag aat aaa aaa aat gaa tgg atc cag gaa aaa gcc 292  
Asn Glu Met Val Glu Asn Lys Lys Asn Glu Trp Ile Gln Glu Lys Ala  
75 80 85

gag gcc act cgc acg ggc aca tac acg tgc agc aac agc aat ggc ctc Glu Ala Thr Arg Thr Gly Thr Tyr Thr Cys Ser Asn Ser Asn Gly Leu 90 95 100	340
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tgc cct ctg aca gac cca cag gtg tcc aat tat tcc ctc atc gag tgt Cys Pro Leu Thr Asp Pro Gln Val Ser Asn Tyr Ser Leu Ile Glu Cys 140 145 150	484
gat ggg aaa tct ctc ccc acg gac ctg acg ttt gtc cca aac ccc aag Asp Gly Lys Ser Leu Pro Thr Asp Leu Thr Phe Val Pro Asn Pro Lys 155 160 165	532
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atg aag cct ggc gtt tcc tac gtc gta cca acc aag aca gac aaa agg Met Lys Pro Gly Val Ser Tyr Val Val Pro Thr Lys Thr Asp Lys Arg 725 730 735 740	2264
aga tcc gca aga ata gac tcg tat ata gaa aga gac gtg act ccc gcc Arg Ser Ala Arg Ile Asp Ser Tyr Ile Glu Arg Asp Val Thr Pro Ala 745 750 755	2312
atc atg gaa gat gac gag ctg gct ctg gac ctg gaa gat ttg ctg agc Ile Met Glu Asp Asp Glu Leu Ala Leu Asp Leu Glu Asp Leu Leu Ser 760 765 770	2360
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tgt att cac aga gat ttg gca gcc agg aat atc ctc ctc act cac ggg Cys Ile His Arg Asp Leu Ala Ala Arg Asn Ile Leu Leu Thr His Gly 790 795 800	2456



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Leu	Leu	Arg	Gly	Gln	Thr	Gly	Thr	Ser	Gln	Pro	Ser	Ala	Ser	Pro	Gly
		20					25						30		

Glu	Pro	Ser	Pro	Pro	Ser	Ile	Gln	Pro	Ala	Gln	Ser	Glu	Leu	Ile	Val
	35					40						45			

Glu	Ala	Gly	Asp	Thr	Ile	Arg	Leu	Thr	Cys	Thr	Asp	Pro	Ala	Phe	Val
	50				55				60						

Lys	Trp	Thr	Phe	Glu	Ile	Leu	Asp	Val	Arg	Ile	Glu	Asn	Lys	Gln	Ser
	65				70				75			80			

Glu	Trp	Ile	Arg	Glu	Lys	Ala	Glu	Ala	Thr	His	Thr	Gly	Lys	Tyr	Thr
		85					90					95			

Cys	Val	Ser	Gly	Ser	Gly	Leu	Arg	Ser	Ser	Ile	Tyr	Val	Phe	Val	Arg
	100					105						110			

Asp	Pro	Ala	Val	Leu	Phe	Leu	Val	Gly	Leu	Pro	Leu	Phe	Gly	Lys	Glu
	115				120							125			

Asp	Asn	Asp	Ala	Leu	Val	Arg	Cys	Pro	Leu	Thr	Asp	Pro	Gln	Val	Ser
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Asn	Tyr	Ser	Leu	Ile	Glu	Cys	Asp	Gly	Lys	Ser	Leu	Pro	Thr	Asp	Leu
	145				150				155			160			

Lys	Phe	Val	Pro	Asn	Pro	Lys	Ala	Gly	Ile	Thr	Ile	Lys	Asn	Val	Lys
	165					170						175			

Arg	Ala	Tyr	His	Arg	Leu	Cys	Ile	Arg	Cys	Ala	Ala	Gln	Arg	Glu	Gly
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Lys Trp Met Arg Ser Asp Lys Phe Thr Leu Lys Val Arg Ala Ala Ile  
195 200 205

Lys Ala Ile Pro Val Val Ser Val Pro Glu Thr Ser His Leu Leu Lys  
210 215 220

Glu Gly Asp Thr Phe Thr Val Ile Cys Thr Ile Lys Asp Val Ser Thr  
225 230 235 240

Ser Val Asp Ser Met Trp Ile Lys Leu Asn Pro Gln Pro Gln Ser Lys  
245 250 255

Ala Gln Val Lys Arg Asn Ser Trp His Gln Gly Asp Phe Asn Tyr Glu  
260 265 270

Arg Gln Glu Thr Leu Thr Ile Ser Ser Ala Arg Val Asn Asp Ser Gly  
275 280 285

Val Phe Met Cys Tyr Ala Asn Asn Thr Phe Gly Ser Ala Asn Val Thr  
290 295 300

Thr Thr Leu Lys Val Val Glu Lys Gly Phe Ile Asn Ile Phe Pro Val  
305 310 315 320

Lys Asn Thr Thr Val Phe Val Thr Asp Gly Glu Asn Val Asp Leu Val  
325 330 335

Val Glu Phe Glu Ala Tyr Pro Lys Pro Glu His Gln Gln Trp Ile Tyr  
340 345 350

Met Asn Arg Thr Pro Thr Asn Arg Gly Glu Asp Tyr Val Lys Ser Asp  
355 360 365

Asn Gln Ser Asn Ile Arg Tyr Val Asn Glu Leu Arg Leu Thr Arg Leu  
370 375 380

Lys Gly Thr Glu Gly Gly Thr Tyr Thr Phe Leu Val Ser Asn Ser Asp  
385 390 395 400

Val Ser Ala Ser Val Thr Phe Asp Val Tyr Val Asn Thr Lys Pro Glu  
405 410 415

Ile Leu Thr Tyr Asp Arg Leu Met Asn Gly Arg Leu Gln Cys Val Ala  
420 425 430

Ala Gly Phe Pro Glu Pro Thr Ile Asp Trp Tyr Phe Cys Thr Gly Ala  
435 440 445

Glu Gln Arg Cys Thr Val Pro Val Pro Pro Val Asp Val Gln Ile Gln  
450 455 460

Asn Ala Ser Val Ser Pro Phe Gly Lys Leu Val Val Gln Ser Ser Ile  
465 470 475 480

Asp Ser Ser Val Phe Arg His Asn Gly Thr Val Glu Cys Lys Ala Ser  
485 490 495

Asn Ala Val Gly Lys Ser Ser Ala Phe Phe Asn Phe Ala Phe Lys Gly  
500 505 510

Asn Ser Lys Glu Gln Ile Gln Pro His Thr Leu Phe Thr Pro Leu Leu  
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Ile Gly Phe Val Val Thr Ala Gly Leu Met Gly Ile Ile Val Met Val  
530 535 540

Leu Ala Tyr Lys Tyr Leu Gln Lys Pro Met Tyr Glu Val Gln Trp Lys  
545 550 555 560

Val Val Glu Glu Ile Asn Gly Asn Asn Tyr Val Tyr Ile Asp Pro Thr  
565 570 575

Gln Leu Pro Tyr Asp His Lys Trp Glu Phe Pro Arg Asn Arg Leu Ser  
580 585 590

Phe Gly Lys Thr Leu Gly Ala Gly Ala Phe Gly Lys Val Val Glu Ala  
595 600 605

Thr Ala Tyr Gly Leu Ile Lys Ser Asp Ala Ala Met Thr Val Ala Val  
610 615 620

Lys Met Leu Lys Pro Ser Ala His Leu Thr Glu Arg Glu Ala Leu Met  
625 630 635 640

Ser Glu Leu Lys Val Leu Ser Tyr Leu Gly Asn His Met Asn Ile Val  
645 650 655

Asn Leu Leu Gly Ala Cys Thr Val Gly Gly Pro Thr Leu Val Ile Thr  
660 665 670

Glu Tyr Cys Cys Tyr Gly Asp Leu Leu Asn Phe Leu Arg Arg Lys Arg  
675 680 685

Asp Ser Phe Ile Phe Ser Lys Gln Glu Glu Gln Ala Asp Ala Ala Leu  
690 695 700

Tyr Lys Asn Leu Leu His Ser Lys Glu Ser Ser Cys Asp Ser Ser Asn  
705 710 715 720

Glu Tyr Met Asp Met Lys Pro Gly Val Ser Tyr Val Val Pro Thr Lys  
725 730 735

Thr Asp Lys Arg Arg Ser Ala Arg Ile Asp Ser Tyr Ile Glu Arg Asp  
740 745 750

Val Thr Pro Ala Ile Met Glu Asp Asp Glu Leu Ala Leu Asp Leu Glu  
755 760 765

Asp Leu Leu Ser Phe Ser Tyr Gln Val Ala Lys Gly Met Ala Phe Leu  
770 775 780

Ala Ser Lys Asn Cys Ile His Arg Asp Leu Ala Ala Arg Asn Ile Leu  
785 790 795 800

Leu Thr His Gly Arg Ile Thr Lys Ile Cys Asp Phe Gly Leu Ala Arg  
805 810 815

Asp Ile Arg Asn Asp Ser Asn Tyr Val Val Lys Gly Asn Ala Arg Leu  
820 825 830

Pro Val Lys Trp Met Ala Pro Glu Ser Ile Phe Asn Cys Val Tyr Thr  
835 840 845

Phe Glu Ser Asp Val Trp Ser Tyr Gly Ile Phe Leu Trp Glu Leu Phe  
850 855 860

Ser Leu Gly Ser Ser Pro Tyr Pro Gly Met Pro Val Asp Ser Lys Phe  
865 870 875 880

Tyr Lys Met Ile Lys Glu Gly Phe Arg Met Leu Ser Pro Glu His Ala  
885 890 895

Pro Ala Ala Met Tyr Glu Val Met Lys Thr Cys Trp Asp Ala Asp Pro  
900 905 910

Leu Lys Arg Pro Thr Phe Lys Gln Val Val Gln Leu Ile Glu Lys Gln  
915 920 925

Ile Ser Asp Ser Ser Lys His Ile Tyr Ser Asn Leu Ala Asn Cys Asn  
930 935 940

Pro Asn Pro Glu Asn Pro Val Val Asp His Ser Val Arg Val Asn  
945 950 955 960

Ser Val Gly Ser Ser Thr Ser Ser Thr Gln Pro Leu Leu Val His Glu  
965 970 975

Asp Ala